

- 21 -

CLAIMS

What is claimed is:

1. A method for preparing a flame barrier composition, the method comprising the steps of:
 - 5 a) reacting an ethyleneamine or a mixture of ethyleneamines with polyphosphoric acid and forming a two phase mixture comprising a viscous syrup that comprises the flame barrier composition, and a non-viscous phase; and
 - b) separating the syrup from the non-viscous phase.
- 10 2. The method of claim 1 in which the polyphosphoric acid has been prepared by ion exchange.
- 15 3. The method of claim 2 in which the ethyleneamine or a mixture of ethyleneamines is selected from the group consisting of ethylenediamine, diethylenetriamine, piperazine, triethylenetetramine, tetraethylenepentamine, pentaethylenhexamine, aminoethylpiperazine, and mixtures thereof.
4. The method of claim 3 in which the ethyleneamine is a mixture of ethyleneamines.
- 15 5. The method of any preceding claim in which the flame barrier composition has a pH of 1.7 to 7.0.
6. The method of any preceding claim additionally comprising, after step b):
 - 20 c) drying the syrup and forming a dried syrup.
 7. The method of claim 6 in which the dried syrup, dried to a water content of less than 0.5% has a weight loss of less than 1.5% at 315°C in a TGA run at 20°C per minute in nitrogen.
 8. The method of claim 6 additionally comprising, after step c),
 - 25 d) the step of adding an ethyleneamine or a mixture of ethyleneamines to the dried syrup.
 9. The method of any preceding claim in which the polyphosphoric acid is prepared from sodium polyphosphate that has an average chain length of at least 10.
 10. A flame barrier composition prepared by the method of any of claims 1 to 9.
 - 30 11. The flame barrier composition of claim 10 in which the concentration of the flame retardant composition in the flame barrier composition is greater 45 wt%.
 12. A method for forming a flame barrier composition, the method comprising

- 22 -

the steps of

a) reacting an ethyleneamine or a mixture of ethyleneamines with polyphosphoric acid and forming a reaction mixture comprising the flame barrier composition; and

5 b) adding an ethyleneamine or a mixture of ethyleneamines to the reaction mixture.

13. A flame barrier composition formed by the method of claim 12.

14. A flame barrier polymer comprising:

a) 30 to 99.75 percent by weight of a polymer or a mixture of polymers; and

10 b) 0.25 to 70 percent by weight of the flame barrier composition of prepared by the method of any of claims 6 to 9.

15. The flame barrier polymer of claim 14 in which flame barrier polymer comprises:

20 to 95 wt% of a polymer selected from the group consisting of polycarbonate,

15 polyphenylene oxide, polyphenylene sulfide, and mixtures thereof;

20 to 95 wt% of a polymer selected from the group consisting of nylon 6, polybutylene terephthalate, polyethylene terephthalate, acrylic polymers, ABS, high impact polystyrene, and mixtures thereof; and

20 0.5 to 20 wt% of the flame barrier composition of prepared by the method of any of claims 6 to 9.

16. A protective barrier composition formed by deposition of the flame barrier composition of claim 10, 11, or 13 either onto a substrate or between two or more substrates.

25 17. A protective barrier composition formed by deposition of the flame barrier polymer of claim 14 either onto a substrate or between two or more substrates.

18. The protective barrier composition of claim 17 in which the flame barrier polymer is deposited between two substrates and the substrates are glass.

30 19. A method for forming a protective barrier composition, the method comprising the step of depositing the flame barrier composition of claim 10, 11, or 13 onto a substrate or between two or more substrates.